

AMENDMENTS TO THE CLAIMS

Claims 1-40 (Canceled)

Claim 41 (New): A transparent article comprising

a substrate;

an optical coating comprising one or more layers on the substrate, where the one or more layers include furthest from the substrate a homogeneous outermost layer comprising amorphous silicon nitride; and

a protective coating on the outermost layer, wherein

the protective coating consists of

a scratch propagation blocker layer on the outermost layer, and

a layer consisting essentially of carbon on the scratch propagation blocker layer; and

the scratch propagation blocker layer is a homogeneous layer comprising a material selected from the group consisting of

Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

nitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W; and

mixtures thereof.

Claim 42 (New): The transparent article according to Claim 41, wherein the substrate comprises a glass.

Claim 43 (New): The transparent article according to Claim 42, wherein the substrate comprises a tempered glass.

Claim 44 (New): The transparent article according to Claim 41, wherein the optical coating is a low-emissivity coating.

Claim 45 (New): The transparent article according to Claim 41, wherein the optical coating is a tempered coating.

Claim 46 (New): The transparent article according to Claim 41, wherein the optical coating contains at least one layer comprising Ag.

Claim 47 (New): The transparent article according to Claim 41, wherein the fracture toughness of the scratch propagation blocker layer is higher than the fracture toughness of the outermost layer.

Claim 48 (New): The transparent article according to Claim 41, wherein the scratch propagation blocker layer is from 2 to 8 nm thick.

Claim 49 (New): The transparent article according to Claim 48, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 50 (New): The transparent article according to Claim 48, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 51 (New): The transparent article according to Claim 41, wherein the layer consisting essentially of carbon is doped with nitrogen.

Claim 52 (New): The transparent article according to Claim 41, wherein the layer consisting essentially of carbon consists of carbon and unavoidable impurities.

Claim 53 (New): The transparent article according to Claim 41, wherein the carbon in the layer consisting essentially of carbon comprises at least one form of carbon selected from the group consisting of diamond-like carbon and graphite.

Claim 54 (New): The transparent article according to Claim 41, wherein the layer consisting essentially of carbon is from 1 to 10 nm thick.

Claim 55 (New): A transparent article comprising

a substrate;

an optical coating comprising one or more layers on the substrate, where the one or more layers include furthest from the substrate a homogeneous outermost layer comprising silicon nitride; and

a protective coating on the outermost layer, wherein

the protective coating consists of

a scratch propagation blocker layer on the outermost layer, and

a layer consisting essentially of carbon on the scratch propagation blocker layer; and

the scratch propagation blocker layer is a homogeneous layer 2 to 8 nm thick comprising a material selected from the group consisting of

Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

nitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;

oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W; and

mixtures thereof.

Claim 56 (New): The transparent article according to Claim 55, wherein the substrate comprises a glass.

Claim 57 (New): The transparent article according to Claim 56, wherein the substrate comprises a tempered glass.

Claim 58 (New): The transparent article according to Claim 55, wherein the optical coating is a low-emissivity coating.

Claim 59 (New): The transparent article according to Claim 55, wherein the optical coating is a tempered coating.

Claim 60 (New): The transparent article according to Claim 55, wherein the optical coating contains at least one layer comprising Ag.

Claim 61 (New): The transparent article according to Claim 55, wherein the fracture toughness of the scratch propagation blocker layer is higher than the fracture toughness of the outermost layer.

Claim 62 (New): The transparent article according to Claim 55, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 63 (New): The transparent article according to Claim 55, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 64 (New): The transparent article according to Claim 55, wherein the layer consisting essentially of carbon is doped with nitrogen.

Claim 65 (New): The transparent article according to Claim 55, wherein the layer consisting essentially of carbon consists of carbon and unavoidable impurities.

Claim 66 (New): The transparent article according to Claim 55, wherein the carbon in the layer consisting essentially of carbon comprises at least one form of carbon selected from the group consisting of diamond-like carbon and graphite.

Claim 67 (New): The transparent article according to Claim 55, wherein the layer consisting essentially of carbon is from 1 to 10 nm thick.

Claim 68 (New): A transparent article comprising
a substrate;
an optical coating comprising one or more layers on the substrate, where the one or more layers include furthest from the substrate a homogeneous outermost layer comprising silicon nitride; and
a protective coating on the outermost layer, wherein
the protective coating consists of a scratch propagation blocker layer on the outermost layer; and
the scratch propagation blocker layer is a homogeneous layer comprising a material selected from the group consisting of
Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;
oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;
nitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W;
oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W; and
mixtures thereof.

Claim 69 (New): The transparent article according to Claim 68, wherein the substrate comprises a glass.

Claim 70 (New): The transparent article according to Claim 69, wherein the substrate comprises a tempered glass.

Claim 71 (New): The transparent article according to Claim 68, wherein the optical coating is a low-emissivity coating.

Claim 72 (New): The transparent article according to Claim 68, wherein the optical coating is a tempered coating.

Claim 73 (New): The transparent article according to Claim 68, wherein the optical coating contains at least one layer comprising Ag.

Claim 74 (New): The transparent article according to Claim 68, wherein the outermost layer comprises amorphous silicon nitride.

Claim 75 (New): The transparent article according to Claim 68, wherein the fracture toughness of the scratch propagation blocker layer is higher than the fracture toughness of the outermost layer.

Claim 76 (New): The transparent article according to Claim 68, wherein the scratch propagation blocker layer is from 2 to 8 nm thick.

Claim 77 (New): The transparent article according to Claim 76, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 78 (New): The transparent article according to Claim 76, wherein the scratch propagation blocker layer comprises a material selected from the group consisting of oxynitrides of Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W.

Claim 79 (New): The transparent article according to Claim 68, wherein the scratch propagation blocker layer is in contact with air.

SUPPORT FOR THE AMENDMENT

This Preliminary Amendment cancels Claim 35-40; and adds new Claims 41-82.

Support for the amendments is found in the specification and claims as originally filed.

In general, support for new independent Claims 41 and 55 is found in canceled independent Claim 35, and support for new independent Claim 68 is found in canceled independent Claim 39.

In particular, support for an outermost layer comprising "amorphous" silicon nitride in Claims 41 and 74 is found in the specification at least at page 7, line 23 ("outermost layer of amorphous silicon nitride").

Support for "oxynitrides" in Claims 41, 50, 55, 63, 68 and 78 is found in Claims 35 and 39 ("mixtures thereof") and in the specification at least at page 9, lines 28-32 ("the SPB layer can be formed by oxidizing ...a ... metal subnitride material including an metal element selected from Ti, Si, Zn, Sn, In, Zr, Al, Cr, Nb, Mo, Hf, Ta and W").

Support for Claims 42-43, 45, 56-57, 59, 69-70 and 72 is found in canceled Claim 40 ("optical coating is a tempered coating") and in the specification at least at page 6, lines 20-21 ("Preferably, the glass and optical coatings are tempered ...").

Support for Claims 44, 58 and 71 is found in the specification at least at page 6, line 19 ("low-emissivity optical coating").

Support for Claims 46, 60 and 73 is found in the specification at least at page 6, line 17 ("Optical coatings including Ag layers") and line 19 ("optical coating including an Ag layer").

Support for Claims 47, 61 and 75 is found in the specification page 7, lines 14-15 ("Preferably, the fracture toughness of the SPB material is higher than that of the outermost layer").

Support for the limitation of a scratch propagation blocker layer "2 to 8 nm thick" in Claims 48, 55 and 76 is found in the specification at least at page 9, line 11 ("The SPB layer can be from 2 to 8 nm thick").

Support for Claims 49-50, 62-63 and 77-78 is found in Claims 41, 55 and 68, respectively.

Support for Claims 51-53 and 64-66 is found in canceled Claims 36-38.

Support for Claims 54 and 67 is found in the specification at least at page 6, line 6 ("The carbon layer can be from 1 to 10 nm thick").

Support for Claim 79 is found in the specification at least at page 11, lines 17-18 ("heating in air can then both burn away the carbon layer and convert the diffusion barrier layer into a transparent metal oxide SPB layer") and lines 23-25 ("FIG. 4C shows that upon heating the metal layer 5 in an atmosphere containing oxygen, such as air, the metal layer 5 is converted to a metal oxide scratch propagation blocker layer 4").

No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 41-79 will be pending in this application. Claims 41, 55 and 68 are independent.

REQUEST FOR RECONSIDERATION

Applicants respectfully request entry of the foregoing and early examination and allowance of the application.

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Norman F. Oblon

A handwritten signature in cursive script, reading "Corwin Paul Umbach", written in dark ink. The signature is positioned above a horizontal line.

Corwin P. Umbach, Ph.D.

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